Progress report 20200416

PokMan Ho

16-Apr-2020

Date Time: 16-Apr-2020 09:00
Location: Skype
People: James, Samraat, Emma, PokMan

1   Follow-up items

2   Topics discussed

1. equilibrium (eqm) convergence between numerical and analytical approaches

2. temperature condition mismatches between published model parameters

3. pairwise parameter effects on eqm solution based on a rough parameter space scan

4. biofuel literature review: how they address carbon harvesting challenge in reality and using mathematical terms

5. thesis write-up

3   Consensus

1. use "BioTrait" data from CMEE miniproject folder to obtain P_0 & B_0 for Arrhenius equation $[A = A_0 exp(E_a/(kT_K))]$

2. use Arrhenius equation to standardize temperature-dependence of rate terms (i.e. growth rates for photocell & bacterial decomposer, photocell intraspecific interference & bacterial decomposer death rate)

3. write full introduction section & send out for feedback

   (a) big question to tackle: how to make an artificial ecosystem of photocell-bacterial decomposer couple to sequester carbon in theory?

   (b) importance of carbon sequestration in modern day society

   (c) existing methods of carbon sequestration description and critique

   (d) knowledge gap in the field of carbon sequestration from existing models (i.e. models comparison)

   (e) project novelty: 3-part system using carbon pool density of organic matter, photocell and bacterial decomposer

   (f) aim of model: max carbon pool size at given temperature (mid-20^oC, as fractions are all given at 23 or 25^oC)